

Title: Emerging Adoption Team Science Revealed Through Scientific Network Analysis

Background: Many adoptive families lack family-preserving post-adoption services due to a shortage of adoption-competent professionals and inadequate knowledge of adoption-related problems and effective interventions. Adoption competency requires a robust body of coherent and relevant evidenced-based knowledge that leads to agreed-upon standards of education and care. The analysis of academic co-citation and co-authorship networks has effectively contributed to the understanding and dissemination of bodies of research literature in healthcare and social sciences, and is presently applied to guide research, support collaboration and speed the translation of knowledge to practice. The purpose of the study is to elucidate the structure and characteristics of scientific relationships within adoption research over the last seventy years that may inform strategies that support competency.

Methods: Thomson Reuters Web of Science Core Collection, PsychInfo and Academic Search Premier databases were searched in all years for adoption-related terms in the title, abstract and keywords of peer-reviewed academic articles. Co-authors and co-cited references were extracted from each article, and used to construct co-authorship and co-citation networks of adoption-related literature from the 1930s to 2014. The networks were analyzed for patterns of connectivity, cohesion, connected components, node centrality, distribution of disciplines and article keywords.

Results: Database search yielded 2771 articles, which were analyzed by time intervals from the pre-1980's to present. Results herein are mostly derived from the comparison between time periods 1990-1994 and 2010-2014. Leading research disciplines in adoption studies have shifted from psychiatry, developmental psychology, pediatrics, general and internal medicine, and genetics and heredity, to developmental psychology, psychiatry, psychology, family studies, pediatrics, and social work. We found a steady increase in the number of papers (178 vs. 786, +341%), authors (384 vs. 1941, +405%) and papers per author (1.27 vs. 1.53, +20.5%). In the co-citation network, a single consistently-growing connected component developed, with increasing density of co-cited authors; however, central authors changed little in the last 15 years. Collaboration increased, with average number of authors per paper rising from 2.74 to 3.77 (+37.6%). Co-authorship networks exhibit small disconnected components coalescing into larger components overtime, with the largest component being 15 authors in 1990-1994 vs. 377 authors in 2010-2014.

Discussion/Conclusion: Adoption research has grown substantially over the last 30 years and is conducted in varied disciplines. Knowledge is increasingly shared across disciplines, and more authors are collaborating beyond their disciplinary comfort zones. With a fivefold growth in the average number of co-authors, and the formation of the giant component typical of academic collaboration networks in single disciplines, the co-authorship network of adoption studies is

reaching a numeric threshold and approaching a structural configuration that are distinctive of well-established and autonomous fields of study. These findings reveal the maturation of adoption studies as team science, and argue for the development of institutional mechanisms that support such evolution. The adoption community should consider instituting practices and infrastructure that identify Adoption Care as a unique, multidisciplinary field. Recommended are a unified professional organization, codified standards of education and care, a formal annual conference and the expansion and support for adoption research centers/institutes.

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